

AMENDMENTS TO THE CLAIMS

Claims 1-9. (Canceled)

Claims 10-15. (Canceled)

Claim 16-19. (Canceled)

Claims 20-33. (Canceled)

34. (New) A substrate processing apparatus, comprising:
a substrate holder for holding a substrate having a copper film thereon;
a processing head having anodes and cathodes, arranged alternately along at least one direction, so as to face the substrate when held by said substrate holder;
a processing liquid supply section for supplying a processing liquid between the substrate, when held by said substrate holder, and said anodes and cathodes; and
a power source for applying a voltage between said anodes and cathodes so as to generate micro-bubbles in the processing liquid when between the substrate and said anodes and cathodes.

35. (New) The substrate processing apparatus according to claim 34, wherein
said power source is for applying a voltage between said anodes and cathodes, so as to generate micro-bubbles in the processing liquid when between the substrate and said anodes and cathodes, by applying a pulse voltage between said anodes and cathodes.

36. (New) The substrate processing apparatus according to claim 35, further comprising:
an ultrasonic transducer for emitting ultrasonic waves to the processing liquid, when between the substrate and said anodes and cathodes, so as to collapse the micro-bubbles.

37. (New) The substrate processing apparatus according to claim 36, wherein said ultrasonic transducer is on said processing head so as to face the substrate when held by said substrate holder.

38. (New) The substrate processing apparatus according to claim 37, further comprising:
another ultrasonic transducer for emitting ultrasonic waves to the processing liquid, when between the substrate and said anodes and cathodes, so as to collapse the micro-bubbles, said another ultrasonic transducer being on said processing head so as to face the substrate when held by said substrate holder, and said ultrasonic transducer and said another ultrasonic transducer being generally triangular in shape and arranged symmetrically about a center of said processing head.

39. (New) The substrate processing apparatus according to claim 36, wherein said processing liquid supply section comprises supply ports and suction ports, with each of said supply ports being in a corresponding one of said cathodes, and with each of said suction ports being in a corresponding one of said anodes.

40. (New) The substrate processing apparatus according to claim 36, wherein a distance between the substrate, when held by said substrate holder, and said anodes differs from a distance between the substrate, when held by said substrate holder, and said cathodes.

41. (New) The substrate processing apparatus according to claim 36, wherein at least one of said substrate holder and said processing head is operable to provide relative movement between the substrate, when held by said substrate holder, and said processing head during application of the pulse voltage between said anodes and cathodes.

42. (New) The substrate processing apparatus according to claim 36, wherein said processing liquid supply section is to supply a processing liquid containing an electrolyte.

43. (New) The substrate processing apparatus according to claim 34, further comprising:

an ultrasonic transducer for emitting ultrasonic waves to the processing liquid, when between the substrate and said anodes and cathodes, so as to collapse the micro-bubbles.

44. (New) The substrate processing apparatus according to claim 43, wherein said ultrasonic transducer is on said processing head so as to face the substrate when held by said substrate holder.

45. (New) The substrate processing apparatus according to claim 44, further comprising:

another ultrasonic transducer for emitting ultrasonic waves to the processing liquid, when between the substrate and said anodes and cathodes, so as to collapse the micro-bubbles, said another ultrasonic transducer being on said processing head so as to face the substrate when held by said substrate holder, and said ultrasonic transducer and said another ultrasonic transducer being generally triangular in shape and arranged symmetrically about a center of said processing head.

46. (New) The substrate processing apparatus according to claim 43, wherein a distance between the substrate, when held by said substrate holder, and said anodes differs from a distance between the substrate, when held by said substrate holder, and said cathodes.

47. (New) The substrate processing apparatus according to claim 43, wherein said processing liquid supply section comprises supply ports and suction ports, with each of said supply ports being in a corresponding one of said cathodes, and with each of said suction ports being in a corresponding one of said anodes.

48. (New) The substrate processing apparatus according to claim 43, wherein said processing liquid supply section is to supply a processing liquid containing an electrolyte.

49. (New) The substrate processing apparatus according to claim 43, wherein at least one of said substrate holder and said processing head is operable to provide relative movement between the substrate, when held by said substrate holder, and said processing head during application of the voltage between said anodes and cathodes.

50. (New) The substrate processing apparatus according to claim 34, wherein said processing liquid supply section comprises supply ports and suction ports, with each of said supply ports being in a corresponding one of said cathodes, and with each of said suction ports being in a corresponding one of said anodes.

51. (New) The substrate processing apparatus according to claim 34, wherein a distance between the substrate, when held by said substrate holder, and said anodes differs from a distance between the substrate, when held by said substrate holder, and said cathodes.

52. (New) The substrate processing apparatus according to claim 34, wherein at least one of said substrate holder and said processing head is operable to provide relative movement between the substrate, when held by said substrate holder, and said processing head during application of the voltage between said anodes and cathodes.

53. (New) The substrate processing apparatus according to claim 34, wherein said processing liquid supply section is to supply a processing liquid containing an electrolyte.